BeAGLE Status, Paper and Proposal

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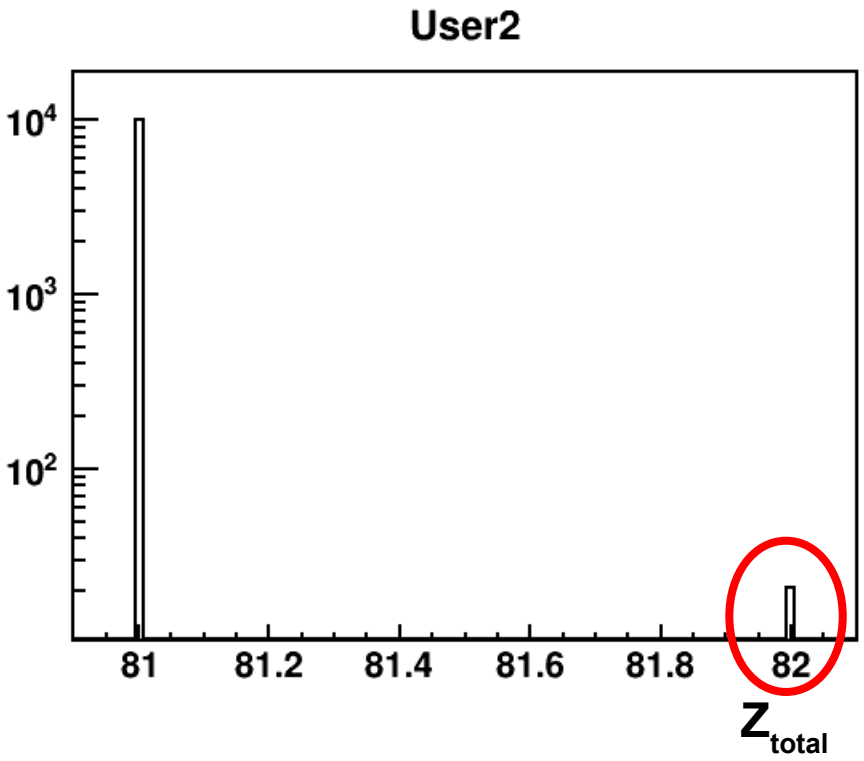
BeAGLE debugging update

Recall: Incorrect handling of hypernuclei.

e- + $^{208}Pb_{82}$ should add up to 81

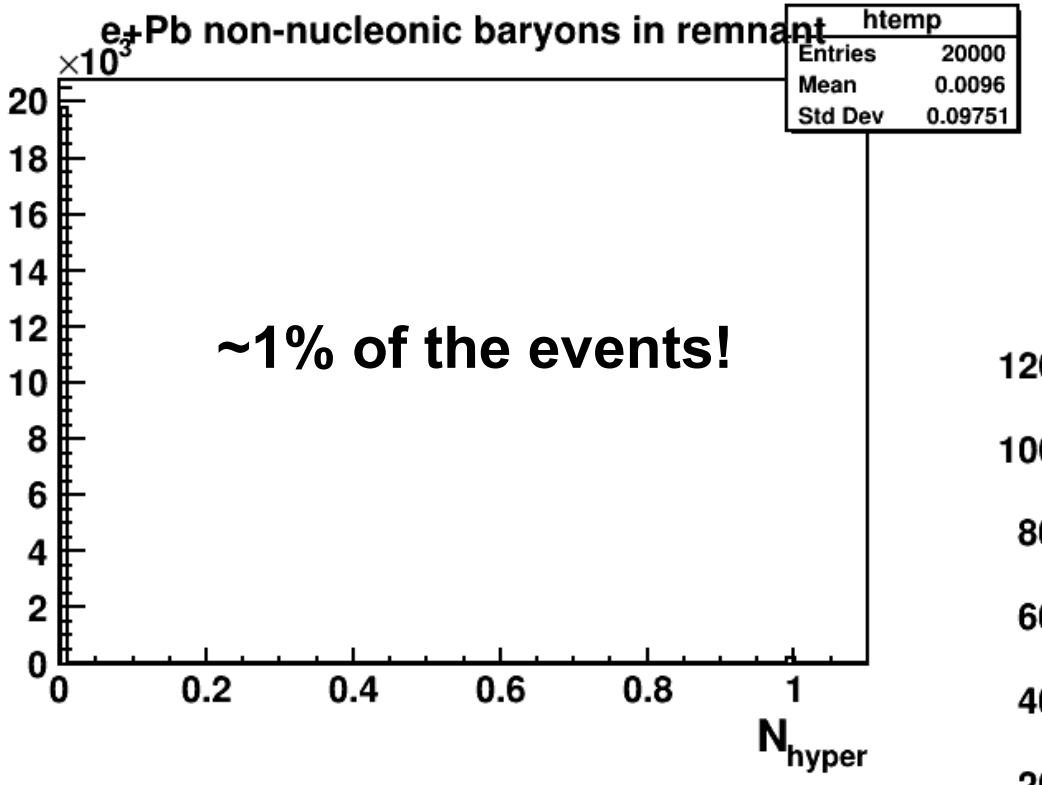


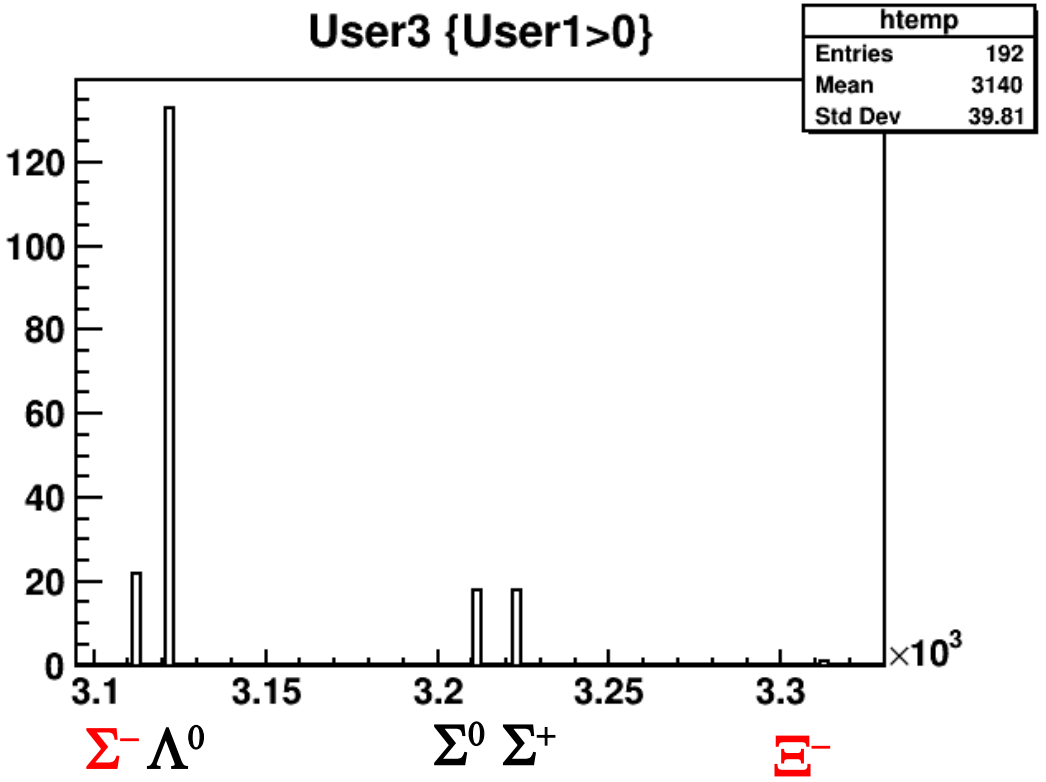
DPMJET, and therefore BeAGLE, has no provision for hypernuclei.
FLUKA does, but I don't know how to use it.

Fixed charge counting, but remnant has no strangeness.

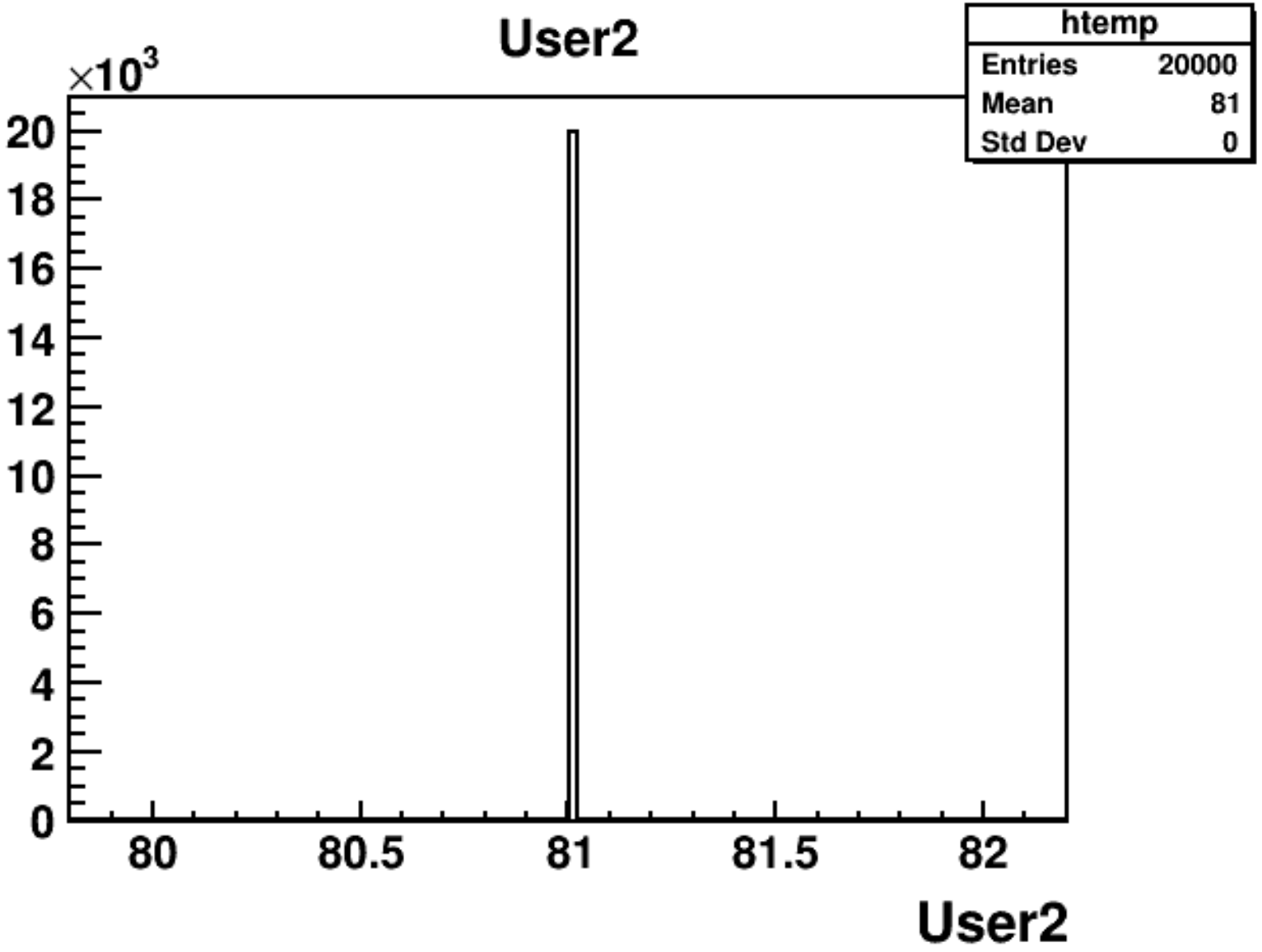
Proper handling of hypernuclei would be interesting, but would take time!

Hypernuclei in inelastic 18x110 e+Pb

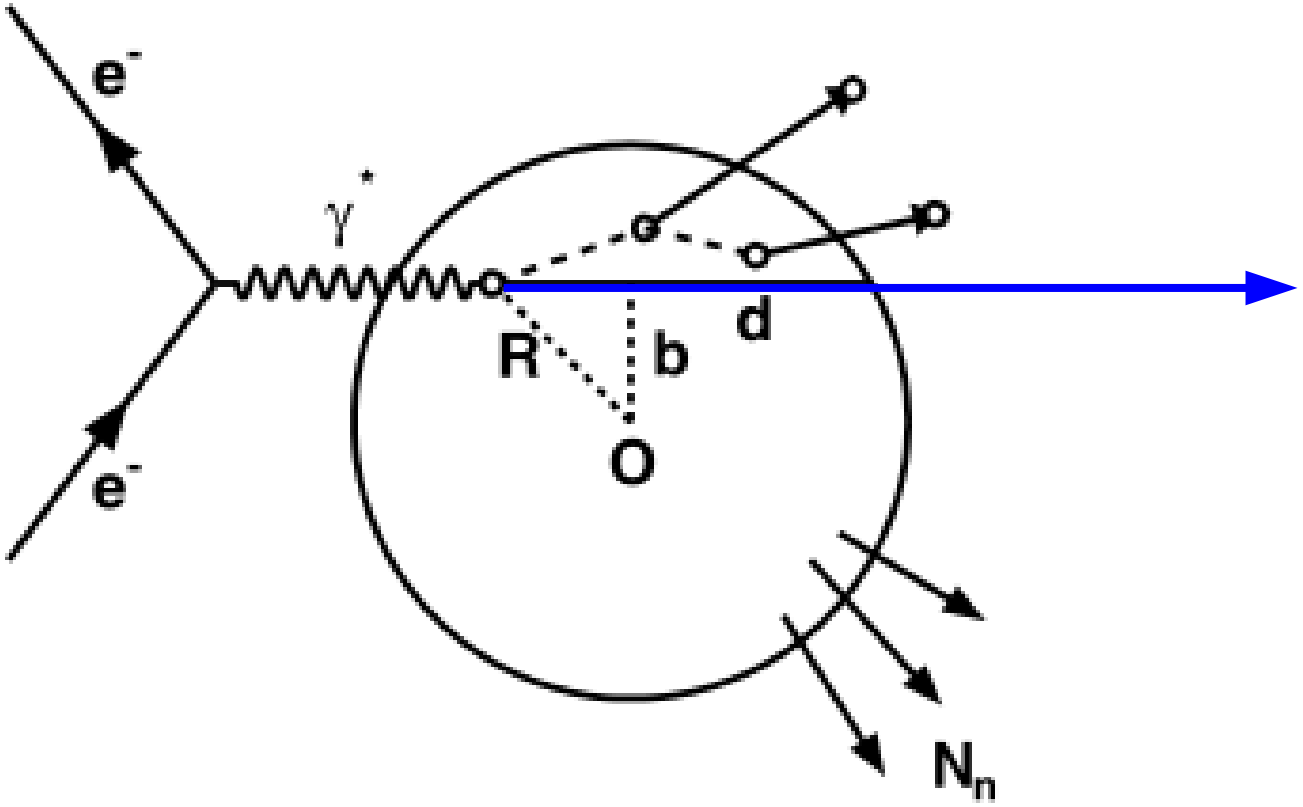




All events have the correct Zsum now...

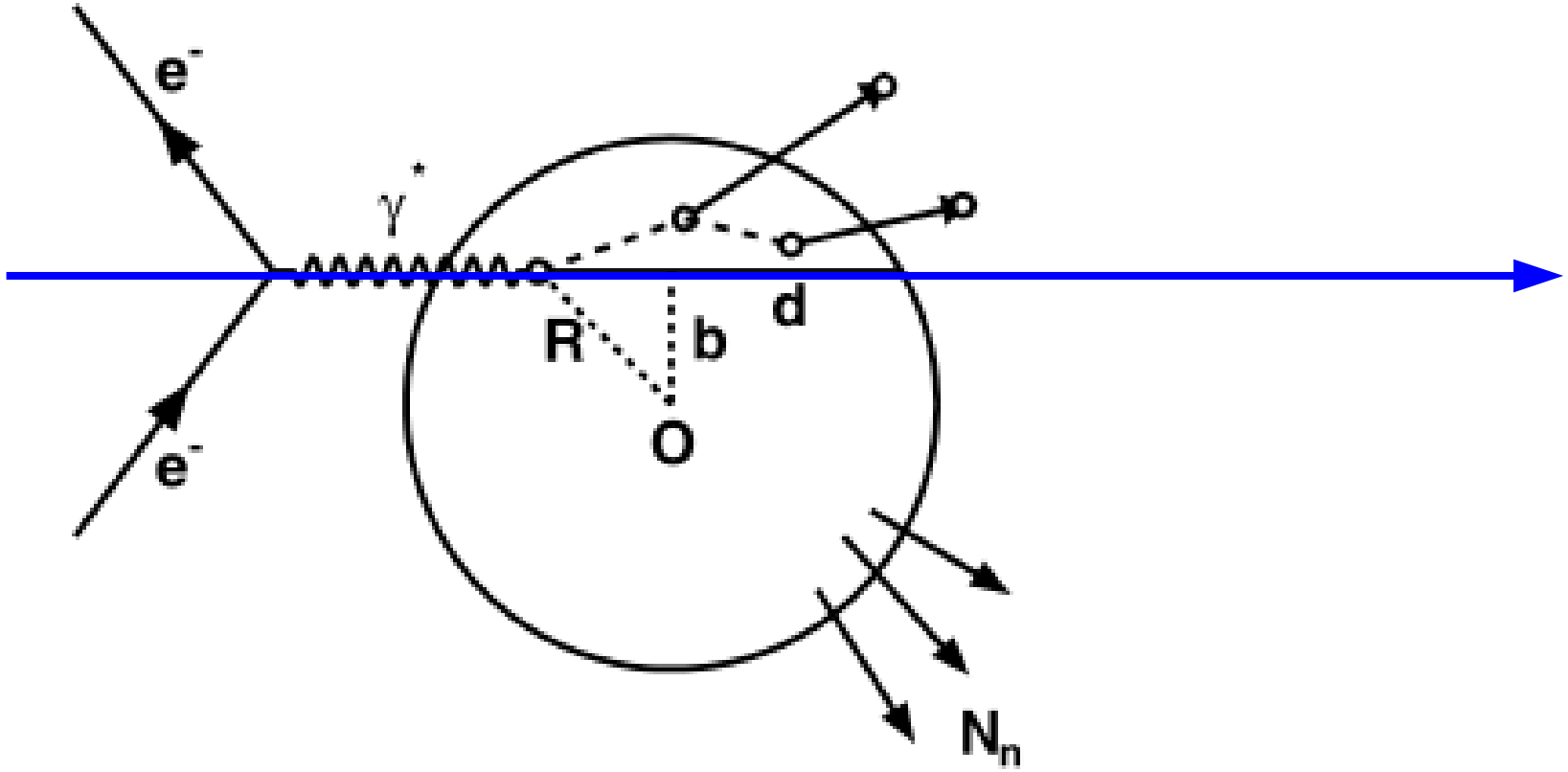


Definition of d and b



Note: Not hard edge definition for d: $d = \int dz\ \rho(b,z) / \rho_0$

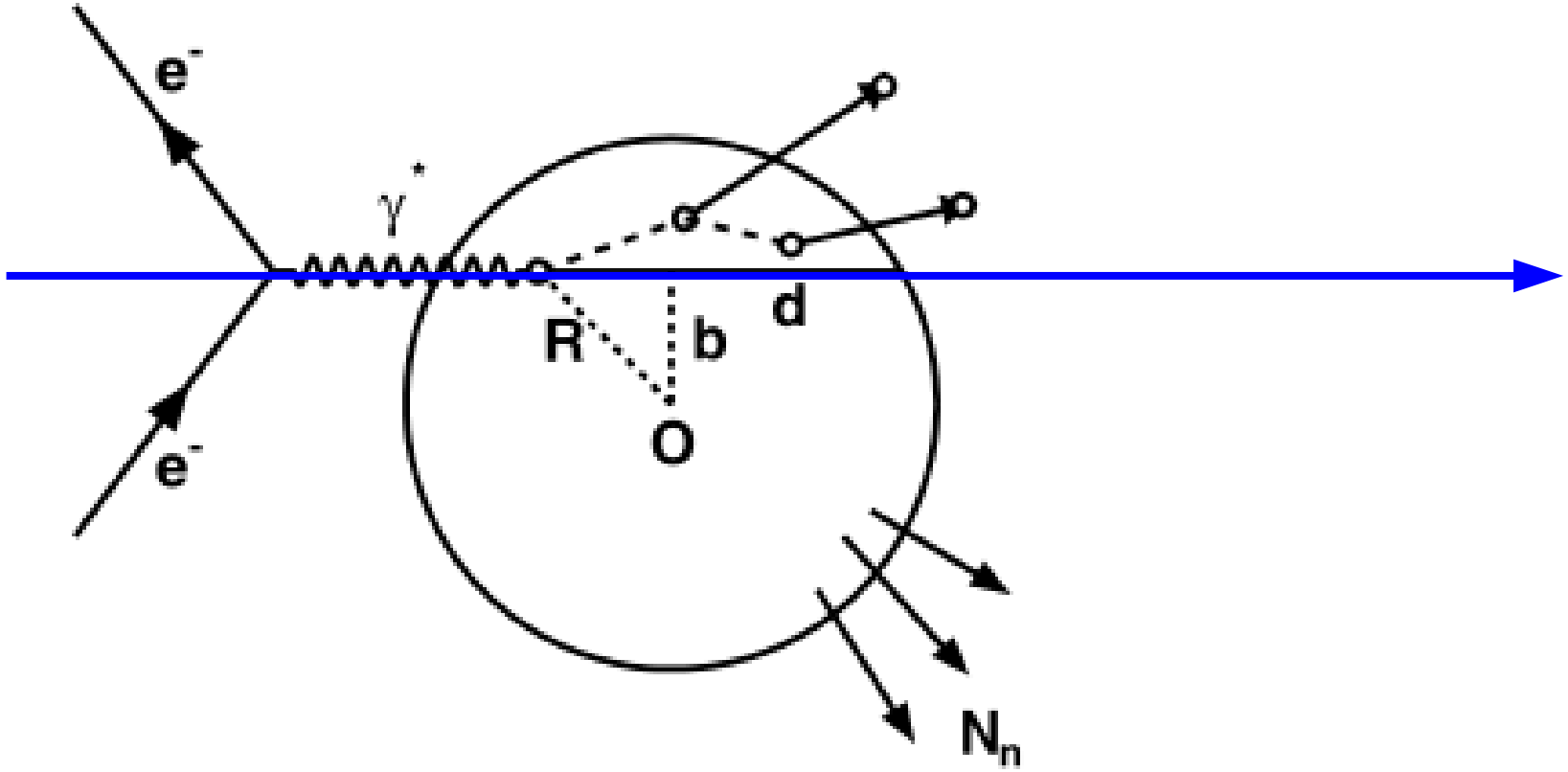
Definition of T(b)



$T(b) = \int_{-\infty}^{+\infty} dz\ \rho(b,z)$ in nucleons/fm^2 or

$\int_{-\infty}^{+\infty} dz\ \rho(b,z) / \rho_0$ in fm

Why we care...



Averaged over all b: $Q_s^2 \sim A^{1/3}$

For fixed b: $Q_s^2 \sim T(b)$ (also better d reach)

Effective "A" for central e+Pb collisions can be large

Paper thoughts – these are all new plots!

- Zheng, Aschenauer, Lee paper w/ DPMJET
  - E_{ZDC} distribution (as well as N_{npart})
  - (b,d) vs. E_{ZDC} (with odd definition for d)
  - (b,d) distributions for cuts in E_{ZDC}
- Baker & Zheng in various talks for BeAGLE:
  - N_{npart} distribution & T(b) for cuts in N_{npart} etc.
- New paper – for BeAGLE:
  - Q^2, ν, W^2 dists. for BeAGLE vs. DPMJET vs. E665
  - E_{ZDC} dist.; T(b) for cuts in E_{ZDC} . Maybe also d.

Proposal focus

- Written due F 6/21. Meeting Th-F 7/11-12.
- Try to shift proposal focus from adding specific features to BeAGLE to supporting EIC physics / detector studies.
- Note: All of the supporting this last few months led to finding new bugs/issues.
- Support + new bugs/issues meant slow progress on original task list...
- Will have to dance a bit in the written proposal. Focus on task progress (RAPGAP) this month.